



August 29, 2012

Mandi Richardson  
URS Corporation  
(512) 419-5321

Re: Duke Energy / Miami Fort CERT Test (Project No. 14950789)

Ms. Richardson,

Attached is the report associated with the seventeen (17) aqueous samples submitted for total metals (As, B, Be, Cd, Co, Cr, Fe, Mn, Na, Ni, Pb, Sb, Se, and Zn) analyses on August 13, 2012. The samples were received on August 14, 2012 in a sealed package at ambient temperature. Total metals analyses were performed via inductively coupled plasma dynamic reaction cell mass spectrometry (ICP-DRC-MS). Any issues associated with the analyses are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

A handwritten signature in black ink that reads "Ben Wozniak".

Ben Wozniak  
Project Manager  
Applied Speciation and Consulting, LLC

# Applied Speciation and Consulting, LLC

Report Prepared for:

Mandi Richardson  
URS Corporation

August 29, 2012

## 1. Sample Reception

Seventeen (17) aqueous samples were submitted for total metals (As, B, Be, Cd, Co, Cr, Fe, Mn, Na, Ni, Pb, Sb, Se, and Zn) analyses on August 13, 2012. The samples were received in acceptable condition on August 14, 2012 in a sealed package at ambient temperature, as recorded on the attached chain of custody (COC) forms.

The samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and designated discrete sample identifiers. All samples had been preserved with nitric acid by the client prior to reception at Applied Speciation and Consulting (ASC). The pH of each sample was confirmed to be less than 2 upon receipt, so all samples were stored in a secure enclosed container until digestion and analysis could be performed.

## 2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Total Metals Quantitation by ICP-DRC-MS All sample fractions had been preserved to pH < 2 by the client. Aliquots of each sample were placed into Teflon bombs, followed by aliquots of concentrated nitric and hydrochloric acids. All Teflon bombs were sealed and placed in a convection oven (maintained at a temperature of 105°C) for a minimum of four hours. All resulting sample digests were then analyzed via inductively coupled plasma dynamic reaction cell mass spectrometry (ICP-DRC-MS).

## 3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of each analytical day. All calibration curves, associated with each species of interest, are standardized by linear regression resulting in a response factor. All sample results are

**instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimal interval of every ten analytical runs.

*Total Metals Quantitation by ICP-DRC-MS* All samples for metals (As, B, Be, Cd, Co, Cr, Fe, Mn, Na, Ni, Pb, Sb, Se, and Zn) quantitation were analyzed by inductively coupled plasma dynamic reaction cell mass spectrometry (ICP-DRC-MS) on August 26<sup>th</sup>-28<sup>th</sup>. Aliquots of each sample are introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (DRC) containing a specific reactive gas which preferentially reacts with either interfering ions of the same target mass to charge ratios ( $m/z$ ) or with the target analyte, producing an entirely different mass to charge ratio ( $m/z$ ) which can then be differentiated from the initial interferences. A solid-state detector detects ions transmitted through the mass analyzer, on the basis of their mass-to-charge ratio ( $m/z$ ), and the resulting current is processed by a data handling system.

#### **4. Analytical Issues**

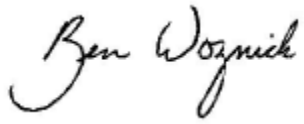
The overall analyses went well and no significant analytical issues were encountered. All quality control parameters associated with these samples were within acceptance limits with the following exceptions:

One of the preparation blanks associated with the sample digestion, identified as PBW1, was determined to be a statistical outlier for chromium and iron upon application of the Grubbs test. This preparation blank has been excluded from all calculations since it is deemed to be unrepresentative of the preparation blanks and the samples.

It should be noted that the estimated method detection limit (eMDL) for each analyte has been calculated using the standard deviation of the method blanks that were prepared and analyzed concurrently with the submitted samples.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Ben Wozniak". The signature is written in a cursive style with a large, looping "B" and a stylized "W".

Ben Wozniak  
Project Manager  
Applied Speciation and Consulting, LLC

Trace Metals Results for URS  
Project Name: Duke Energy / Miami Fort CERT Test (Project No. 14950789)  
Contact: Mandi Richardson

Date: August 29, 2012  
Report Generated by: Ben Wozniak  
Applied Speciation and Consulting, LLC

**Sample Results**

Sample ID	Date Collected	As	B	Be	Cd	Co	Cr	Fe
Unit 8 BAS	8/8/2012	13.2	439	ND (<0.53)	ND (<0.20)	0.545	0.61	32.8
CCW	8/8/2012	3.15	240	ND (<0.53)	ND (<0.20)	1.11	2.86	1240
FB-1	8/8/2012	ND (<0.34)	ND (<6.7)	ND (<0.53)	ND (<0.20)	0.164	ND (<0.60)	6.4
Unit 8 BW-3	8/8/2012	7.15	NR	6.72	791	1080	1.57	232*
Unit 8 BW-2	8/8/2012	0.68	109	NR	NR	NR	NR	ND (<4.2)
Unit 8 BW-10	8/8/2012	6.10	NR	4.69	606	793	0.78	177*
Unit 8 BW-13	8/8/2012	6.60	NR	6.81	765	1020	2.94	231*
DUP-100	8/8/2012	6.82	NR	6.52	803	1050	1.67	237*
IDI-4	8/8/2012	7.08	NR	ND (<0.53)	1.21	6.45	10.6	39.6
IDI-1	8/8/2012	7.55	NR	ND (<0.53)	20.9	10.4	10.1	19.3
Unit 8 BAS	8/9/2012	21.6	518	ND (<0.53)	ND (<0.20)	0.448	ND (<0.60)	4.6
CCW	8/9/2012	3.46	245	ND (<0.53)	ND (<0.20)	1.57	1.76	1280
IDI-1	8/9/2012	6.48	NR	ND (<0.53)	11.4	6.94	2.23	12.1
Unit 8 BW-3	8/9/2012	6.36	NR	8.27	770	989	1.65	224*
Unit 8 BW-10	8/9/2012	5.62	NR	2.86	475	609	ND (<0.60)	207*
Unit 8 BW-13	8/9/2012	6.32	NR	6.73	775	999	1.10	221*
IDI-4	8/9/2012	6.32	NR	ND (<0.53)	1.70	7.90	6.38	31.4

All results reflect the applied dilution and are reported in µg/L

ND = Not detected at the applied dilution

NR = Not requested

\* Reported from Batch 2; all other Fe results reported from Batch 1

Trace Metals Results for URS  
Project Name: Duke Energy / Miami Fort CERT Test (Project No. 14950789)  
Contact: Mandi Richardson

Date: August 29, 2012  
Report Generated by: Ben Wozniak  
Applied Speciation and Consulting, LLC

**Sample Results**

Sample ID	Date Collected	Mn	Na	Ni	Pb	Sb	Se	Zn
Unit 8 BAS	8/8/2012	55.9	50800	5.19	0.076	0.65	1.76	5.4
CCW	8/8/2012	108	63100	7.52	1.35	0.36	ND (<0.46)	NR
FB-1	8/8/2012	1.12	ND (<280)	ND (<0.97)	0.250	0.14	ND (<0.46)	ND (<5.1)
Unit 8 BW-3	8/8/2012	351000	639000	6200	0.177	4.69	2350	13900
Unit 8 BW-2	8/8/2012	3.80	NR	NR	NR	NR	8.13	NR
Unit 8 BW-10	8/8/2012	272000	523000	4650	0.061	4.06	1670	8690
Unit 8 BW-13	8/8/2012	357000	647000	5880	0.123	4.53	2180	13100
DUP-100	8/8/2012	357000	665000	6080	0.171	5.01	2170	13600
IDI-4	8/8/2012	227	509000	6.20	0.114	4.54	926	NR
IDI-1	8/8/2012	6200	497000	20.5	ND (<0.053)	5.87	1640	ND (<5.1)
Unit 8 BAS	8/9/2012	27.9	65000	4.18	ND (<0.053)	0.91	0.78	ND (<5.1)
CCW	8/9/2012	106	60800	6.71	1.39	0.32	ND (<0.46)	NR
IDI-1	8/9/2012	4130	460000	9.14	ND (<0.053)	3.94	1080	5.6
Unit 8 BW-3	8/9/2012	346000	624000	5780	0.209	4.36	1960	13100
Unit 8 BW-10	8/9/2012	217000	436000	3550	0.068	3.58	1410	5340
Unit 8 BW-13	8/9/2012	358000	649000	5860	0.366	4.49	2000	12400
IDI-4	8/9/2012	433	491000	6.87	0.076	4.81	1030	NR

All results reflect the applied dilution and are reported in µg/L

ND = Not detected at the applied dilution

NR = Not requested

Trace Metals Results for URS  
Project Name: Duke Energy / Miami Fort CERT Test (Project No. 14950789)  
Contact: Mandi Richardson

Date: August 29, 2012  
Report Generated by: Ben Wozniak  
Applied Speciation and Consulting, LLC

**Quality Control Summary - Preparation Blank Summary**

Analyte	Units	Batch	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL 50x	RL 50x	eMDL 5000x	RL 5000x
As	µg/L	-	0.47	0.25	0.34	0.21	0.32	0.11	0.34	5.0	-	-
B	µg/L	-	0.6	6.0	2.2	2.6	2.8	2.2	6.7	200	-	-
Be	µg/L	-	-0.20	-0.61	-0.48	-0.35	-0.41	0.18	0.53	5.0	-	-
Cd	µg/L	-	-0.12	0.04	-0.06	-0.03	-0.04	0.07	0.20	5.0	-	-
Co	µg/L	-	0.141	0.123	0.107	0.135	0.126	0.015	0.045	5.0	-	-
Cr	µg/L	-	2.88*	-0.16	0.23	-0.06	0.00	0.20	0.60	5.0	-	-
Fe	µg/L	1	22.7*	-0.4	0.5	2.3	0.8	1.4	4.2	50	-	-
Fe	µg/L	2	21.2*	0.5	1.6	1.1	1.1	0.6	1.7	50	-	-
Mn	µg/L	-	-0.02	-0.08	0.03	0.08	0.00	0.07	0.20	5.0	20	500
Na	µg/L	-	162	8	-16	-36	30	90	280	500	28000	50000
Ni	µg/L	-	0.63	0.93	0.17	0.45	0.55	0.32	0.97	5.0	-	-
Pb	µg/L	-	0.067	0.061	0.048	0.027	0.051	0.018	0.053	5.0	-	-
Sb	µg/L	-	0.11	0.09	0.08	0.02	0.08	0.04	0.11	5.0	-	-
Se	µg/L	-	-0.45	-0.72	-0.74	-0.48	-0.60	0.15	0.46	5.0	-	-
Zn	µg/L	-	1.6	-2.1	-1.0	-1.8	-0.8	1.7	5.1	50	-	-

eMDL = Estimated Method Detection Limit; please see narrative regarding eMDL calculations

RL = Reporting Limit

\* This preparation blank is identified as an outlier using the Grubbs test and therefore has been excluded from all calculations

Trace Metals Results for URS  
Project Name: Duke Energy / Miami Fort CERT Test (Project No. 14950789)  
Contact: Mandi Richardson

Date: August 29, 2012  
Report Generated by: Ben Wozniak  
Applied Speciation and Consulting, LLC

**Quality Control Summary - Certified Reference Materials**

Analyte	Units	Batch	CRM	True Value	Result	Recovery
As	µg/L	-	TMDA-70	40.7	37.97	93.3
B	µg/L	-	LCS	500.0	555.3	111.1
Be	µg/L	-	TMDA-70	15.2	14.60	96.0
Cd	µg/L	-	TMDA-70	145	154.1	106.3
Co	µg/L	-	TMDA-70	285	307.3	107.8
Cr	µg/L	-	TMDA-70	389	418.4	107.6
Fe	µg/L	1	TMDA-70	369	416.5	112.9
Fe	µg/L	2	TMDA-70	369	349.1	94.6
Mn	µg/L	-	TMDA-70	302	321.8	106.5
Na	µg/L	-	LCS	10000	9740	97.4
Ni	µg/L	-	TMDA-70	328	349.6	106.6
Pb	µg/L	-	TMDA-70	444	489.8	110.3
Sb	µg/L	-	TMDA-70	21.7	23.60	108.8
Se	µg/L	-	TMDA-70	25.9	28.6	110.6
Zn	µg/L	-	TMDA-70	480	506.1	105.4



Trace Metals Results for URS  
 Project Name: Duke Energy / Miami Fort CERT Test (Project No. 14950789)  
 Contact: Mandi Richardson

Date: August 29, 2012  
 Report Generated by: Ben Wozniak  
 Applied Speciation and Consulting, LLC

**Quality Control Summary - Matrix Duplicates**

Analyte	Units	Batch	Sample ID	Rep 1	Rep 2	Mean	RPD
As	µg/L	-	Unit 8 BW-13 (8/9/2012)	6.32	6.18	6.25	2.2
B	µg/L	-	Batch QC	1338000	1333000	1336000	0.4
Be	µg/L	-	Unit 8 BW-13 (8/9/2012)	6.73	5.54	6.14	19.4
Cd	µg/L	-	Unit 8 BW-13 (8/9/2012)	775.0	780.1	777.6	0.7
Co	µg/L	-	Unit 8 BW-13 (8/9/2012)	999.2	1008	1004	0.9
Cr	µg/L	-	Unit 8 BW-13 (8/9/2012)	1.10	3.95	2.52	112.8*
Fe	µg/L	1	Batch QC	663.2	701.0	682.1	5.5
Fe	µg/L	2	Unit 8 BW-13 (8/9/2012)	221.4	242.6	232.0	9.2
Mn	µg/L	-	Unit 8 BW-13 (8/9/2012)	357500	351800	354700	1.6
Na	µg/L	-	Unit 8 BW-13 (8/9/2012)	649200	653500	651400	0.7
Ni	µg/L	-	Unit 8 BW-13 (8/9/2012)	5856	5938	5897	1.4
Pb	µg/L	-	Unit 8 BW-13 (8/9/2012)	0.366	0.176	0.271	70.1*
Sb	µg/L	-	Unit 8 BW-13 (8/9/2012)	4.49	4.57	4.53	1.8
Se	µg/L	-	Unit 8 BW-13 (8/9/2012)	2000	2025	2013	1.2
Zn	µg/L	-	Unit 8 BW-13 (8/9/2012)	12410	12730	12570	2.5

ND = Not detected at the applied dilution

NC = Not calculated due to one or more concentrations below the eMDL

\* Sample concentrations are less than the RL

Trace Metals Results for URS  
 Project Name: Duke Energy / Miami Fort CERT Test (Project No. 14950789)  
 Contact: Mandi Richardson

Date: August 29, 2012  
 Report Generated by: Ben Wozniak  
 Applied Speciation and Consulting, LLC

**Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate**

Analyte	Units	Batch	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Result	Recovery	RPD
As	µg/L	-	Unit 8 BW-13 (8/9/2012)	500.0	541.5	107.1	500.0	559.7	110.7	3.3
B	µg/L	-	Batch QC	500.0	1288000	NC	500.0	1281000	NC	0.5
Be	µg/L	-	Unit 8 BW-13 (8/9/2012)	500.0	492.3	97.2	500.0	503.1	99.4	2.2
Cd	µg/L	-	Unit 8 BW-13 (8/9/2012)	50.00	823.3	NC	50.00	816.4	NC	0.8
Co	µg/L	-	Unit 8 BW-13 (8/9/2012)	500.0	1538	106.9	500.0	1546	108.4	0.5
Cr	µg/L	-	Unit 8 BW-13 (8/9/2012)	500.0	541.4	107.8	500.0	557.8	111.1	3.0
Fe	µg/L	1	Batch QC	10000	10740	100.6	10000	10950	102.7	1.9
Fe	µg/L	2	Unit 8 BW-13 (8/9/2012)	10000	10180	99.5	10000	10520	102.9	3.3
Mn	µg/L	-	Unit 8 BW-13 (8/9/2012)	500.0	334100	NC	500.0	336600	NC	0.7
Na	µg/L	-	Unit 8 BW-13 (8/9/2012)	10000	627200	NC	10000	612800	NC	2.3
Ni	µg/L	-	Unit 8 BW-13 (8/9/2012)	500.0	6337	NC	500.0	6488	NC	2.4
Pb	µg/L	-	Unit 8 BW-13 (8/9/2012)	50.00	43.92	87.3	50.00	43.44	86.3	1.1
Sb	µg/L	-	Unit 8 BW-13 (8/9/2012)	50.00	64.81	120.6	50.00	63.50	118.0	2.0
Se	µg/L	-	Unit 8 BW-13 (8/9/2012)	500.0	2482	93.9	500.0	2316	60.7*	6.9
Zn	µg/L	-	Unit 8 BW-13 (8/9/2012)	500.0	12910	NC	500.0	13180	NC	2.1

NC = Not calculated; spiking level is less than one-fifth the ambient sample concentration

\* The spiking level is less than the ambient concentration

From: URS Corporation  
525 Vine Street - Suite 1800  
Cincinnati, Ohio 45202  
Phone 513-651-3440

To: Applied Speciation  
Bothell, Wa  
Attn: B. Wozniak

## CHAIN-OF-CUSTODY RECORD

Project No.: 14950789		Project Name: Miami Fort FGD CERT		Number of Con- tainers	<div style="text-align: center;"> <i>Trace Metals *</i> </div>										Remarks		
Samplers: (signature) <i>[Signature]</i>																	
Sta. No.	Date	Time	Comp.	Grab	Station Location												
	8/8/12	0830		X	Unit 8 BAS	1	X										pres. w/ HNO <sub>3</sub>
		0915		X	CCW	1	X										pres. w/ DI + HNO <sub>3</sub>
		0920		X	FB-1	1	X										
		1100		X	UNIT 8 BW-3	1	X										
		1115		X	UNIT 8 BW-2	1	X										
		1120	<i>[Signature]</i>	X	UNIT 8 BW-10	1	X										
		1140	<i>[Signature]</i>	X	UNIT 8 BW-13	1	X										
		1200	<i>[Signature]</i>	X	DUP-100	1	X										
		1410	<i>[Signature]</i>	X	IDI-4	1	X										pres. with HNO <sub>3</sub>
	<i>[Signature]</i>	1420			IDI-1	1	X										pres. with HNO <sub>3</sub> + D.I.
Relinquished by: (signature)		Date/Time		Received by: (signature)		Relinquished by: (signature)		Date/Time		Received by: (signature)		Relinquished by: (signature)		Date/Time		Received by: (signature)	
<i>[Signature]</i>		08-13-12 1200		<i>[Signature]</i>		<i>[Signature]</i>		8/13/12 1410		<i>[Signature]</i>		<i>[Signature]</i>					
Relinquished by: (signature)		Date/Time		Received by: (signature)		Relinquished by: (signature)		Date/Time		Received by: (signature)		Relinquished by: (signature)		Date/Time		Received by: (signature)	
Relinquished by: (signature)		Date/Time		Received for Laboratory by: (signature)		Date/Time		Remarks:									
				<i>[Signature]</i>		8/14/12 9:45		Temp: ambient									

Distribution: Original accompanies shipment; Copy to:

Field Files \* SEE CONTRACT FOR METALS LIST

## RESULTS:

DUKE: joseph.potts@duke-energy.com

URS: mike.wagner@urs.com



From: URS Corporation  
525 Vine Street - Suite 1800  
Cincinnati, Ohio 45202  
Phone 513-651-3440

To: Applied Speciation  
Bothell, Wa  
Attn: B. Wozniak

CHAIN-OF-CUSTODY RECORD

Project No.: 14950789		Project Name: Miami Fort FGD CERT		Number of Con- tainers	<div style="text-align: center;">TRACE METALS</div> <div style="text-align: right;">all samples preserved w/ DI Remarks + HNO<sub>3</sub> except where noted</div>										
Samplers: (signature) <i>[Signature]</i>															
Sta. No.	Date	Time	Comp.	Grab	Station Location										
	8-8-12	1420		X	IDI-1	1	X								
	8/9/12	0830		X	unit 8 BAS	1	X								preserved w/ HNO <sub>3</sub> only
		0915		X	CCW	1	X								
		1320		X	IDI-1	1	X								
		1100		X	unit 8 BW-3	1	X								
		1110		X	unit 8 BW-10	1	X								
		1120		X	unit 8 BW-13	1	X								
		1310		X	IDI-4	1	X								preserved w/ HNO <sub>3</sub> only
Relinquished by: (signature) <i>[Signature]</i> Date/Time 08-13-12 1200 Received by: (signature) <i>[Signature]</i> Date/Time 8/13/12 1340															
Relinquished by: (signature) Date/Time Received by: (signature) Date/Time															
Relinquished by: (signature) Date/Time Received for Laboratory by: (signature) <i>[Signature]</i> Date/Time 8/14/12 9:15 Remarks: temp: Ambient															

Distribution: Original accompanies shipment; Copy to:

Field Files

\* See Contract

RESULTS:

DUKE: joseph.potts@duke-energy.com  
URS: mike.wagner@urs.com